supreme expression of the art and science of our profession, and one which our profession and, yes, the public can foster, nourish and nurture for the good of all concerned.

—MSMW

Prevention of Meningococcal Disease: Practice and Prospects

In 1977 the occurrence of meningococcal disease in the United States, at least as reported through official public health channels, was close to a record low: 1,752 cases were reported, up only slightly from the five-year median of 1,355 cases reported annually from 1972 through 1976.[1] In spite of this small number of cases, meningococcal infection continues to evoke a deep fear, sometimes bordering on hysteria, in the circle of acquaintances of a person stricken with the disease, and also evokes a wide range of responses on the part of physicians in dealing with persons so exposed.

A number of factors can be cited that undoubtedly contribute to physician uncertainty in managing persons exposed to a patient with meningococcal disease. First, the infrequency of the disease makes it statistically unlikely that any single physician will need to confront the issue more than once every five or ten years. Second, the degree of risk among exposed persons under nonepidemic conditions has only recently been defined with some degree of accuracy. Third, authoritative recommendations for the chemoprophylaxis of meningococcal infection have been frankly contradictory.[2,3]

For all of these reasons, the findings of Juels and his colleagues—elsewhere in this issue—describing their observations on the management of meningococcal disease in California should come as no great surprise. Particularly worthy of note was the finding that chemoprophylaxis of some kind was given to 68 percent of household contacts, but also to 83 percent of nonhousehold contacts. Penicillin, a drug known to be ineffective in eradicating the meningococcal nasopharyngeal carrier state, was by far the single most popular drug given for chemoprophylaxis.

These data are particularly relevant, since they strike, at it were, very close to home. The aggregate performance of California physicians in this situation is, however, not substantively different from that described by the Meningococcal Disease Surveillance Group for the year 1974 in the entire country.[4] They identified a similar series of problems in that chemoprophylactic drugs were often given too late to achieve maximal preventive benefit, inappropriate drugs such as penicillin were used in a high proportion of instances, or chemoprophylaxis was provided to persons whose degree of contact was such that there was probably no increased risk of meningococcal disease.

Therefore, it seems appropriate to restate, briefly, the rationale and recommendations for chemoprophylaxis of meningococcal disease. An increased risk of meningococcal disease has been clearly shown for household contacts of a case, even under nonepidemic conditions.[2,5] Although the available data do not permit precise quantitation of the degree of risk, virtually all studies point to the fact that the degree of risk in exposed household contacts is several hundred or more times greater than the risk of the general population. Consequently, chemoprophylaxis, directed at household contacts, particularly children, seems eminently justifiable.

Drugs known to be ineffective for meningococcal prophylaxis include penicillins, ampicillin, erythromycin, and tetracyclines with the single exception of minocycline. The vestibular reactions reported to occur after the administration of as little as a single 100-mg dose of minocycline have, however, imposed severe limitations on its utility in meningococcal chemoprophylaxis. The currently recommended regimen is rifampin, 600 mg every 12 hours for four doses in adults, 10 mg per kg of body weight every 12 hours for four doses in children 1 to 12 years old and 5 mg per kg of body weight per dose every 12 hours for four doses in children less than 12 months of age.[10]

No chemoprophylactic regimen is 100 percent effective, and occasional failures undoubtedly will occur. The "failure" described by Khouri-Boulos,[5] however, was probably due to reacquisition of Neisseria meningitidis from a baby-sitter who had not received rifampin chemoprophylaxis.

The decision to provide chemoprophylaxis to family contacts of a case should be made promptly, without resorting to prior nasopharyngeal cultures. Munford and his colleagues,[6] studying the occurrence of secondary cases in the major epidemic in Sao Paulo, Brazil, in 1972, found that 33 percent of secondary cases occurred within the first four days after the initial or index case was diagnosed. Furthermore, a nasopharyngeal

culture is only a sampling procedure, at best, and might miss meningococci even if present. Finally, one could argue with some reason that the person in whom a culture is negative may be at greater risk of disease than the person who is already carrying meningococci in an asymptomatic fashion, since the carrier state is generally an immunizing event.

Perhaps the greatest psychological pressures for chemoprophylaxis are brought to bear in the case of nonhousehold contacts, particularly classroom contacts. Utilizing the opportunity provided by the recent epidemic in Brazil, Jacobson and his colleagues[7] convincingly showed that there was no significantly increased risk associated with classroom exposure to a student with meningococcal meningitis; thus, no recommendation for chemoprophylaxis of classroom contact can be made.

Science ends at this point with regard to chemoprophylaxis, and the art of medicine must take over. Recognizing the almost hysterical fear that sometimes occurs in persons exposed to this disease, the understanding and perceptive physician may sometimes elect, quite justifiably, to provide chemoprophylaxis for psychological reasons alone.

The companion report in this issue by Oill and her associates provides a vivid illustration of a "household" outbreak and illustrates what can happen when an unusually invasive strain is disseminated into a susceptible population. Such dramatic outbreaks are fortunately infrequent, but invariably one wonders just what it was about that particular strain of group B Neisseria meningitidis that made it so highly invasive? Are there detectable differences between strains with obvious disease producing potential and the other strains that so many of us carry around harmlessly (perhaps beneficially) in our nasopharynges? Answers to this question are slowly emerging, and appear to be distinctly affirmative. Both Frasch and Chapman[8] and Gold and co-workers[9] have been investigating antigens of Neisseria meningitidis other than the serogroup (A, B, C, and so forth) capsular antigens. Subcapsular protein antigens, localized to the outer membrane of the cell envelope, have been identified, at least some of which are common to all the usual serogroups of meningococci.

Work recently reported by Griffiss and associates from Walter Reed Army Institute of Research[10] suggests that one or more of such subcapsular antigens may be associated with invasiveness or epidemic potential. Therefore, certain antigens are almost invariably present in meningococci isolated from cases, but generally absent in organisms isolated from healthy carriers. These findings raise the possibility that protein subcapsular antigens may ultimately form the basis for another approach to immunization against meningococcal disease. Although polysaccharide vaccines against both group A and group C meningococci have been highly effective, no satisfactory polysaccharide vaccine directed against group B meningococci has been developed. If antibody directed against protein subcapsular antigens can be shown to be protective, it may prove possible to prepare vaccines containing such protein antigens that will, in effect, protect against meningococci of all serogroups. Such an approach seems well worth pursuing.

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Public Views of NHI

DURING THE MONTH of October 1977 the Department of Health, Education, and Welfare conducted an intensive outreach effort to solicit the public's views of national health insurance (NHI). Public hearings were held in every state and more than 8,600 persons and organizations provided oral or written comments. Health professionals and professional organizations and other medical groups were well represented, as were the elderly, the general public, insurance companies and many others. A report of this considerable effort has recently become available.[1]